



Building the Supply Chain of the Future



In today's transformed business world, the push-based manufacturing philosophy and the siloed planning processes of the past are proving insufficient to manage ongoing demand volatility. Supply chain leaders have moved to a push/pull based planning paradigm that synchronizes the supply chain with real-world market demand — while also respecting asset utilization, production cost and other operational constraints.

The past few years have brought radical changes to the world of supply chain management. The climate in which companies are operating today is not only more complex — due to shorter product life cycles, increasing service demands from channels, price erosion and global customers with specialized needs — but it is also much more uncertain due to supply risks. If the recent past has taught manufacturers anything, it's that the market situation can change quickly and dramatically, and a product shortage can turn into surplus capacity seemingly overnight.

Manufacturers around the world are grappling with the challenge of meeting fickle market demand in a new, uncertain economy, without making risky investments in high inventory levels and costly production assets. The good news is that by synchronizing inventory, production and distribution processes as closely as possible with actual demand levels, manufacturers can make their supply chains both agile and profitable — creating a significant edge over companies mired in their old ways of doing business.

In order to create a truly agile, synchronized supply chain, most businesses face significant obstacles. Traditional planning processes have largely been siloed, lacking integrated decision making across multiple functional areas, as well as any involvement from supplier and channel partners. Intuitive reactions to market volatility, such as stockpiling inventory in a "push-based" manufacturing stance, have drained precious resources.

Supply chain leaders are overcoming these obstacles by strategically reconfiguring their already complex supply chains, making a variety of structural, organizational, and process changes that increase agility and minimize risk exposure. Their focus is on defining and implementing fundamental changes to their planning processes, allowing a single physical supply chain to support multiple channels and different operating models such as make-to-stock, make-to-order, assemble-to-order and engineer-to-order. They are shifting from the push based approach of the past to a supply chain management model in which actual market "pull" forms the basis for every supply chain decision.

The Challenge of Planning in a Transformed World

When demand levels were flatter and more predictable, customer service was the great differentiator for most manufacturers, who embraced make-to-stock, product-pushing operational strategies. Today, as working capital management has become a priority, businesses seek to minimize inventory to free up working capital and maintain a strong bottom line. The extreme demand volatility of the past several years has only complicated this challenge.

Also adding complexity is the geographically scattered nature of today's supply chain. Manufacturers used to focus on achieving the best piece part cost, but in today's global business environment, product cost issues are much more complex. Manufacturing executives must understand and manage the total landed cost of all goods and services, which reflects the new realities of the global supply chain, with its intricate web of offshore suppliers, multiple transportation and distribution nodes, and flexible manufacturing options.

While individual facilities used to be managed vertically, today the global supply chain extends beyond the four walls of any one facility — encompassing a network of worldwide trading partners who collaborate closely with one another in serving the end consumer's needs, while also protecting the overall profitability of the supply network.

Traditional planning processes are failing to manage today's new demand volatility, as well as the geographically dispersed nature of the global supply chain. They do not provide a holistic supply chain perspective across all functional areas, which is needed to provide meaningful decision support. It is practically impossible for traditional, siloed planning processes to keep all the nodes in the worldwide supply chain synchronized with ever-shifting demand.

The Need for Connected, Closed-Loop Planning

Instead of relying on traditional siloed planning processes, supply chain leaders are implementing powerful closed loop planning processes which synchronize all core activities — including demand planning, inventory planning, master planning, factory scheduling and supplier collaboration. Via this closed-loop process, actual performance is continuously monitored against planned results, and adjustments are quickly made to reflect the new reality.

When a deviation occurs in one area — for example, when a supplier fails to deliver, a customer cancels an order, or labor

costs rise in an offshore facility — there is a synchronized, consistent impact felt across the entire network. Plans across the supply chain are immediately adjusted to reflect this event.

This closed-loop process ensures that, even when the unexpected occurs, the end-to-end value chain can be re-set with speed and agility to continue its support of top-level operational and profitability goals. Processes are orchestrated across the end-to-end global supply chain, so that the end result is a synchronized, highly effective response to changing business conditions.

By using intelligent decision support tools and closed-loop planning processes, supply chain leaders are maintaining the high level of agility needed in today's marketplace, while also managing the constraints imposed by their own financial and operational goals. In an uncertain market environment, powerful planning processes and linked technology solutions are able to sense demand shifts and automatically balance a number of priorities — including costs, customer service levels, supply risks, production constraints and environmental targets — to achieve the best possible outcome.

Aligning Planning Processes in Six Core Areas

In any supply chain, there are six core business processes that must be closely synchronized in order to enable organizational agility. If planning processes in any one of these areas are operating in isolation, the global supply chain will not be able to achieve its highest potential. Disconnects prevent the manufacturing organization from responding as a single entity to fluctuating demand levels — and result in sub-optimal decisions.

Sales and operations planning (S&OP). The S&OP process cannot be led by the sales and operations teams, with limited participation from executives. Instead, it should be a continuous process in which executives have visibility and input, so that the resulting plans reconcile short-term demand predictions with long-term organizational goals. S&OP must occur at both the operational and the executive levels, bringing both views together in an ongoing, closed-loop planning process that focuses on achieving consensus. Across every part of the organization, the S&OP process provides a disciplined cadence for monitoring and synchronizing demand, production, supply, inventory and financial plans via a rigorous Plan-Do-Check-Act process. The entire supply chain can share a common perspective on any issues and agree on an appropriate path for resolution.

Demand planning. Advanced statistical modeling — supported by multiple algorithms tailored to unique item characteristics — must be applied to ensure that sourcing, production, inventory, transportation and distribution functions are optimized based on a shared forecast. The right forecasting algorithm should be applied to each product, based on that product's unique

demand behavior — creating an extremely accurate baseline forecast. Advanced technology solutions should deliver a single set of rolling numbers for the next 24 months or longer, with each element of the plan translated into specific actions, goals and implications for every part of the supply chain. Advanced demand planning tools should also account for the impact of promotional and external events that will have repercussions across the global supply chain.

Inventory planning. “One size fits all” inventory plans fail to recognize the differences among products. Instead, leading manufacturers are using advanced tools to create highly customized “designer” inventory strategies based on consumption patterns, criticality, velocity and other key product attributes. Products are segmented based on these critical characteristics, and managed accordingly. Wherever possible, inventory decisions are postponed to minimize financial risk, and inventory levels are managed by exception to maximize time and cost efficiency. Advanced technology solutions consider existing multi-echelon network complexity, lead times, costs and constraints, as well as demand and supply variability — ensuring that inventory plans are aligned with the rest of the global supply chain.

Master planning. Instead of approaching master supply chain planning as a monthly or quarterly event, leading manufacturers are reviewing, analyzing and updating supply plans daily to maximize customer satisfaction, while also protecting their profits. Through a problem-oriented design, their planners are intuitively guided to monitor performance issues and exceptions, wherever they occur in the global supply network. In addition, a layered planning approach allows planners to rank their business objectives and make informed trade-offs. With clear visibility into the root causes or constraints that are creating the problem, planners can interactively adjust constraints and business rules, resulting in continuous performance improvements for the overall business. While global supply chains have grown significantly in complexity, advanced technology solutions have kept pace with that trend, enabling even the most sophisticated networks to be modeled in a realistic manner.

Factory planning and scheduling. Optimized production plans should be defined for plants, departments, work cells and production lines by scheduling backward from the requirement date — while simultaneously considering material and capacity constraints to create feasible, executable plans. Advanced solutions should streamline and align the activities of production control, manufacturing, and procurement planning teams by automating mundane tasks and shifting the focus to more important functions. These technology tools should also provide time-phased reporting on key factory performance metrics, enabling planners to take corrective measures for both short- and long-term planning. By applying a management-by-exception approach, planners can eliminate unnecessary work, minimize planning fatigue and assess a variety of scenarios when the unexpected occurs.



Collaborative supply planning. Most manufacturers purchase parts and assemblies from a range of diverse and geographically scattered suppliers, and these parts have very different lead times, demand profiles and inventory strategies. Advanced technology tools enable manufacturers to manage this diversity through customized business rules and policies that track performance exceptions based on a unique set of part characteristics. Dashboards, exception-based reporting and early warning systems allow supply issues to be identified and resolved before they impact the global network. Backed by the power of advanced technology solutions, planners can track the entire life cycle of procured parts — enabling them to adjust forecasts, production schedules, transportation plans and other supply chain activities when late deliveries and other events impact the overall manufacturing flow.

Synchronized Planning at Work: Case Studies

It can be challenging to transform traditional siloed planning processes into one fully integrated, synchronized, closed-loop planning process that extends across the global supply chain. However, as a number of supply chain leaders are demonstrating, the bottom-line benefits are well worth the cultural and organizational changes required to build the supply chain of the future:

- **Essar Steel**, one of the largest global steel producers, has significantly improved profitability, customer satisfaction and operational efficiency via a synchronized planning process that enables the business to anticipate and respond proactively to any business changes. Utilization of critical assets has been enhanced by extended demand visibility, capacity projection and better load balancing through advanced order planning. Forecast accuracy has increased by nearly 30 percent for domestic contract customers, and the response time to customer inquiries has been reduced from two hours to six seconds.
- A global leader in flash memory storage solutions, **SanDisk** profitably balances supply to meet demand via a synchronized and adaptive supply chain. By utilizing a pull-based model, the company optimally drives factory builds based on real demand. Once SanDisk knows how a demand change will impact supply, a postponement strategy is used to pull orders and build to inventory targets. SanDisk has the flexibility to redirect work-in-process items and finished products to other regions and customers as demand changes, while still maintaining a high customer service rate and optimal inventory levels. Inventory turns have more than doubled, while overall inventory was reduced by 50 percent in just a two-year span.
- **Dell's** unique configure-to-order model has helped revolutionize supply chain management. The personal computer manufacturer segments worldwide customer demand at a very granular level — then leverages its flexible global supply chain capabilities to meet very specific consumer needs. A dedicated center of excellence gathers sales, marketing and operations requirements, then matches them with an appropriate production strategy. By implementing this pull based model, Dell saved an incredible \$1.5 billion in operations costs between 2008 and 2010.
- As India's largest paint company, **Asian Paints** sells more than 1,200 standard products to 25,000 retail customers. Advanced planning solutions synchronize key processes from sales forecasting through master production planning, raw materials planning, distribution planning and shop floor scheduling. Master planning technologies determine which products should be produced at which plants, incorporating variables such as cost and demand volume, capacity, current inventory levels, environmental requirements, safety stock requirements and transportation costs. Finished goods inventories have been reduced from 56 days to 30 days, and the company has achieved 87 to 90 percent service levels for SKU sales at the location level.
- **Continental Corporation** is the fifth-largest automotive supplier in the world. The company has synchronized supply chain activities in its tire businesses to create detailed manufacturing plans that consider all demand, supply and production constraints. Optimized production plans can be generated within hours, and demand shifts are quickly accommodated on the shop floor, eliminating excess materials, labor and inventory costs. Planning time has been reduced by more than 90 percent, and the planning horizon was multiplied by a factor of 10. Inventory turns nearly doubled within a short time frame.

Are You Prepared for the Future?

As these results demonstrate, manufacturing businesses of all types can realize substantial improvements across their global supply chains by transforming from a “push” mindset to a more nimble “pull” stance. They can realize diverse improvements including revenue increases, inventory reductions, better asset utilization, lower materials costs and service enhancements such as fewer stockouts. Overall, JDA estimates that the average manufacturer can realize a 15 to 25 percent operating margin improvement by synchronizing all supply chain planning activities with the pull of actual market demand.

Looking toward the future, there is only one real certainty: that uncertainty will continue to prevail. Consumers will continue to shift in their confidence and spending habits. Materials and transportation costs will keep fluctuating. Channel preferences will evolve.

The only way to manage your worldwide supply chain profitably in this uncertain environment is to understand true market demand at the earliest possible stage — then synchronize all your planning processes and make the right decisions based on that insight. The ability to create a synchronized, agile, pull based supply chain will separate the leaders from the followers as economic uncertainty continues.



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